

REMARKS

Claims 1-40 are pending in this application, of which claims 16-40 are withdrawn from consideration.

Claim 1 has been amended to change the amount of polymer produced in the first polymerization stage (I) from "10 and 99%" to --10 and 90%--, the support of which can be found in the specification as originally filed (page 8, lines 1-2).

The specification has been amended to correct a typographical error, that is, change the weight of porous deactivated polypropylene at page 30, line 4 from 100 g to 65 g. The inventor has filed a Rule 1.132 Declaration simultaneously to attest that the mistake is solely resulted from a typographical error.

Claim Rejections

Rejection Under 35 U.S.C. § 112, first paragraph

A. Response to Rejection of Claims 1-15 under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement.

By this amendment, claim 1 has been amended to claim that the range of the amount of polymer produced in the first polymerization stage (I) is between 10 and 90% by weight. The amended claims are now believed to be in compliance with 35 U.S.C. § 112, first paragraph. Reconsideration and withdrawal of the rejection respectfully is requested.

B. Response to Rejection of Claims 1-15 under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement.

The specification has been amended to correct a typographical error at page 30, line 4. The correct weight of porous deactivated polypropylene should be 65 g instead of 100 g. The inventor has filed a Rule 1.132 Declaration to attest that the mistake is solely resulted from a typographical error. The amended specification is now believed to be in compliance with 35 U.S.C. § 112, first paragraph. Reconsideration and withdrawal of the rejection respectfully is requested.

Rejection Under 35 U.S.C. § 103

Response to the Rejection of Claims 1-15 under 35 U.S.C. § 103(a) as being unpatentable over Govoni et al. in view of Canich et al.

In response to the rejection of claims 1-15 under 35 U.S.C. § 103(a) as being unpatentable over US Patent No. 5,589,549 by Govoni et al. ("Govoni") in view of US Patent No. 6,194,341 by Canich et al. ("Canich"), Applicants respectfully submit that a *prima facie* case of obviousness has not been made out by the Examiner and respectfully traverse the rejection.

In order to establish a *prima facie* case of obviousness, the Examiner must establish all three of the following essential criteria: (1) there must be a motivation in the cited prior art to modify the reference as suggested by the Examiner (MPEP §2143.01); (2) the cited reference must provide a basis for a reasonable expectation for success (MPEP §2143.02); and (3) the cited reference must teach or suggest each of the claimed elements (MPEP §2143.03). The motivation to modify and the reasonable expectation for success must come from the cited prior art and not the Applicants' specification. Further, it is not enough that a reference can be modified absent a suggestion in the cited prior art to undertake such modification (MPEP §2143.01).

The present invention relates to a multi-stage process for the polymerization of olefins comprising two sequential polymerization steps:

- (I) a first polymerization stage using a Ziegler-Natta Ti or V catalyst to prepare an olefinic polymer with a particular porosity value, and
- (III) a second polymerization stage, carried out in the presence of the thus obtained porous polymer on which a late transition metal catalyst is supported.

wherein the amount of polymer produced in the first polymerization stage (I) is between 10 and 90% by weight relative to the total amount of polymer produced in stages (I) and (III).

The technical problem (page 4, lines 14-17) to be solved by the present invention is to obviate the drawbacks which are correlated with the use of late transition metal catalysts supported on the inorganic carriers, such as SiO₂ or Al₂O₃. As clearly disclosed in the specification that "the supportation on silica and alumina of a late transition metal

catalyst leads to lower catalytic activities in comparison with homogeneous polymerization reactions." (page 4, lines 8-9). Moreover, "the supportation causes a substantial decrease of the branch-producing tendencies (branches/1000 carbon atoms) of these catalysts, thus leading to polymers having greater melting points and lower processability." (page 4, lines 9-12).

The multistage process of the present invention solves the above technical problem by supporting late transition metal catalysts on a specified amount of the porous polymer obtained in the first polymerization stage. The successful results as demonstrated by the examples of the invention show that this type of supports allows to improve the polymerization activity, and at the same time, preserve the branching-tendency of these catalysts.

Govoni teaches a multistage process for the polymerization of olefins $\text{CH}_2=\text{CHR}$ comprising:

- (1) a first polymerization stage, in which in the presence of a Ziegler-Natta catalyst system, an olefinic polymer is obtained;
- (2) a second polymerization stage, in which a further polymerization is carried out in the presence of a metallocene type catalyst.

Canich discloses a mixed transition metal polymerization catalyst comprising at least one late transition metal catalyst and a Ziegler-Natta or a metallocene catalyst. Therefore, it teaches a bimetallic catalyst system comprising both a late transition metal catalytic component and a Ziegler-Natta catalytic component. But Canich only teaches a single stage polymerization process and does not refer to a multistage polymerization process. As a matter of fact, Canich requires that the two catalytic components are first mixed together and then the olefin is introduced into the obtained mixture to carry out a single-stage polymerization. As emphasized in Canich, "A primary advantage of the mixed catalysts of this invention is that blends can be produced in a single reactor without the difficulties and expenses associated with an added physical blending step after production of the polymer in the reactor..." (column 16, lines 19-23). It further rationalizes that the use of a mixed catalyst system in a single reactor can avoid the difficulties caused by widely different viscosities between the high molecular weight polymers made by the mixed

catalysts since "the polymer chains are mixed on a molecular level during the polymerization process using mixed catalysts." (column 16, lines 26-28).

It is clear that there is no motivation for a person skilled in the art to combine the two cited prior art references since both reference are silent as to the technical problem, that is the lower catalytic activity and the decrease of the branching tendency, involved by the supportation of late transition metal catalysts on silica and alumina.

Moreover, Canich teaches away from polymerizing olefins by means of a multistage polymerization process and use of a porous olefinic polymer carrier produced in the first stage polymerization as claimed in the present invention since the polymer formed in the second stage of polymerization is not mixed with the polymer formed in the first stage of polymerization on a molecular level as required by Canich.

As a matter of fact the "proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose," (MPEP §2143.01) since the use of catalysts in a multistage polymerization as disclosed in Govoni will not generate polymer chains which "are mixed on a molecular level" as required by Canich in their polymerization by using a mixed catalyst system in a single stage polymerization.

In view of the above, the disclosure and the examples in Canich completely teach away from the technical features of the present invention as claimed in the amended Claim 1 and render prior art unsatisfactory for intended purpose. (MPEP §2145 X. D.). In addition, the prior art references cannot be combined where reference teaches away from their combination (MPEP §2145 X. D. 2.) since Govoni teaches a multistage polymerization and Canich requires a single stage polymerization. Reconsideration and withdrawal of the Rejection respectfully is requested.

Applicants respectfully request that a timely Notice of Allowance be issued in this case. Should the Examiner have questions or comments regarding this application or this amendment, Applicants' attorney would welcome the opportunity to discuss the case with the Examiner.

The Commissioner is hereby authorized to charge U.S. PTO Deposit Account 08-2336 in the amount of all fees required for consideration of this Amendment.

This is intended to be a complete response to the Office Action mailed November 4, 2004.

Respectfully submitted,

Gianni Collina et al.

Feb. 2, 2005
(Date)

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I hereby certify that this correspondence is being deposited with sufficient postage thereon with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 2, 2005.

John A. Dutton
Feb 2 2005
Date of Signature